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### RECORD OF REVISIONS

Rev	Date	Description	POC	RM
0	8/16/04	Initial issue; effective 8/16/04.	Kelly Bingham, <i>FWO-DECS</i>	Gurinder Grewal, <i>FWO-DO</i>
1	2/1/06	Added Welding Insp doc reqts (4.1.G); changed eye exam std from Jaeger 1 to Jaeger 2 (5.1.B); OST became ISD.	Kelly Bingham, <i>ENG-DECS</i>	Mitch Harris, <i>ENG-DO</i>

**Contact the Welding Standards POC for upkeep, interpretation, and variance issues.**

<b>GWS 1-11</b>	<b>Welding POC/Committee</b> <a href="http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#weld">http://www.lanl.gov/f6stds/pubf6stds/engrman/HTML/poc_techcom1.htm#weld</a>
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## **GWS 1-11 INSPECTOR QUALIFICATION - VISUAL AND NDE**

### **1.0 PURPOSE AND SCOPE**

- A. The purpose of this procedure is to establish the qualification and certification requirements for personnel performing visual welding (VT) inspections and/or other nondestructive examinations (NDE) in support of the LANL Welding Program.
- B. The scope of this procedure applies to personnel conducting visual welding inspections (VT) and NDE under the LANL Welding Program, including subcontractor personnel when invoked by specification or contract.

### **2.0 REFERENCES**

- 1. GWS 1-01, Introduction and Scope
- 2. GWS 1-02, Administrative Control of Welding & Brazing

### **3.0 ACRONYMS AND DEFINITIONS**

<b>Acronym Term</b>	<b>Description</b>
<b>ET</b>	Eddy current
<b>ENG</b>	Engineering Division
<b>GWS</b>	General Welding Standards
<b>MT</b>	Magnetic particle
<b>NDE</b>	Non-destructive examinations: An examination process conducted to detect internal or surface defects in materials using techniques that do not damage or destroy the item being tested. The most common types of NDE are RT, UT, MT, PT, and ET methods. Depending on the applicable code, VT may also require control as an NDE process in accordance with this procedure
<b>PT</b>	Liquid penetrate
<b>RT</b>	Radiography
<b>SSS</b>	Support Services Subcontractor
<b>UT</b>	Ultrasonic
<b>VT</b>	Visual Examination
<b>WPA</b>	Welding Program Administrator (LANL)

## 4.0 GENERAL

### 4.1 Responsibilities

- A. The **LANL WPA** is responsible for overall implementation of the LANL Welding Program.
- B. The **LANL PS-1 Institutional Quality Manager** is responsible for certification of LANL welding inspection and NDE personnel in accordance with procedure.
- C. The **LANL Project / Program Managers and Facility Managers** are responsible for coordination of welding inspections and nondestructive examinations conducted in support of assigned projects, in accordance with the Administrative Control of Welding section (GWS 1-02) of this program.
- D. Qualified and certified personnel of the **SSS** may be used in support of required welding inspections and NDE performed under the LANL Welding Program.
- E. **Subcontractor inspection and NDE personnel** shall be qualified and certified in accordance with this procedure or an equivalent procedure approved by the LANL WPA when invoked by specification or contract, and in accordance with Reference 1.
- F. **Welding inspection and NDE personnel** shall be independent of production (i.e., they shall not have direct responsibility for performance or supervision of the work they are assigned to inspect/examine).
- G. **Welding inspection and NDE personnel** - Welding inspections shall be documented. (Ref. GWS 1-02 Para. 5.6, 5.8, & Attachment 3)
- H. Personnel performing welding at LANL shall be qualified and certified in accordance with GWS 1-05, *Welder Performance Qualification and Certification*.

**NOTE:** This procedure is not applicable to welders conducting in-process inspection or visual examination of their own work.

## 5.0 PROCEDURE

### 5.1 Vision Requirements

- A. Welding inspection and NDE personnel shall undergo an annual vision examination by LANL HSR2. Results of this examination shall be recorded on Attachment 1, or an equivalent form, for all vision examinations.
- B. Vision examinations shall assure natural or corrected near distance visual acuity such that the individual can read J-2 letters on a standard Jaeger chart, or equivalent, in at least one eye. The ability to perceive an Ortho-Rater minimum of 10 or equivalent shall be considered an acceptable Jaeger equivalent.
- C. Natural or corrected far distance visual acuity shall be verified at 20/30 or better in at least one eye using the Snellen scale or equivalent.
- D. A color test shall be administered upon initial certification to confirm that each individual can recognize four basic colors (red, yellow, blue and green). The color test need not be repeated unless there is reason to believe the individual has experienced a change in color vision.

- E. Individuals not passing the near or far distance vision test requirements shall obtain the necessary correction prior to certification. Personnel who fail to identify the minimum number of color plates shall be required to demonstrate the capability of distinguishing and differentiating contrast between colors. This may be accomplished by practical demonstration (e.g., yarn test). The responsible NDE Level III Engineer shall review such tests for impact during certification.
- F. Elimination of the need for corrective lenses due to surgery (e.g., laser vision correction) should be noted on the annual re-certification.

## **5.2 Welding Inspector Qualification (Other than NDE)**

- A. Personnel who perform welding inspections for acceptance shall hold a current AWS-CWI, AWS-SCWI, or AWS-CAWI under the direct supervision of an AWS-CWI, an ASNT-SNT-TC-1A Level II or Level III in visual method or:
- B. Alternately, they may apply for a LANL PS-1 IQMG or WPA approved equivalent certification and be considered qualified provided they meet the following:
  - A high school diploma or equivalent and a minimum of five (5) years experience in design, fabrication, welding, installation, and inspection of related industrial or nuclear construction; or
  - A related technical school diploma and a minimum of two (2) years experience in design, fabrication, welding, installation, or inspection of related industrial or nuclear construction, or
  - Demonstrate to PS-1 IQMG or WPA a working knowledge of the welding discipline through a combination of interviews, ability demonstrations, and/or written or verbally administered examinations.
- C. When engineering specifications and fabrication/construction codes do not mandate formal certification for visual welding inspectors, the qualification requirements of paragraph 5.2.B may be applied to individual welders or craft/technician supervision.

## **5.3 Nondestructive Examination Personnel**

Personnel performing NDE for acceptance shall be qualified and certified in accordance with the following

- A. Personnel performing NDE test methods shall be qualified and certified as Level II, a Level III or a Level I working under the direct supervision of a Level II or Level III in the appropriate test methods.
  - Qualification and certification shall be in accordance with a written practice (certification program) developed to meet the requirements of the applicable code or standards and ASNT-TC-1A or CP-189, as applicable.
  - Only Level II or Level III certified personnel may evaluate and accept test results.
  - Personnel interpreting only radiographic results (film interpreters) shall be certified as RT Level II (R) “Restricted” as a minimum. Personnel certified as RT Level II or Level III shall be considered qualified film interpreters.

- B. All Levels of NDE personnel shall be recertified periodically in accordance with one of the following criteria:
- Evidence presented to LANL PS-1 IQMG or WPA of continuing performance in the respective NDE method.
  - Re-examination as defined for each level of certification as determined by LANL PS-1 IQMG or WPA.
- C. Recertification intervals are:
- Level I & II - every three (3) years; and
  - Level III – every five (5) years.
  - NDE personnel may be reexamined any time at the discretion of LANL PS-1 IQMG or WPA and have their certifications extended or revoked.
  - A PS-1 IQMG written practice (procedure) shall include rules covering the duration of interrupted service that requires re-examination and recertification.
- D. Where permitted by applicable codes or standards, personnel performing NDE (including VT) may alternatively be qualified and certified in accordance with a program established for LANL inspections.
- E. As a minimum this program shall include the following:
- Instruction in the fundamentals of NDE
  - On-the-job training for familiarization with the appearance and interpretation of indication of weld defects
  - An annual eye examination
  - An oral or written examination, and performance examination, to determine qualification to perform the required examinations and interpret the results.
- F. Attachment 2, *Certification of Qualification* or equivalent shall be completed for individuals meeting the criteria for NDE certification. The NDE personnel shall require recertification when a specific NDE method has not been performed within one year, or when there have been substantial changes in the associated procedures or equipment.
- G. LANL PS-1 IQMG or WPA shall maintain a file of qualification records for LANL welding inspection and NDE personnel.

## **6.0 ATTACHMENTS**

Attachment 1: Eye Test Certification

Attachment 2: Certificate of Qualification